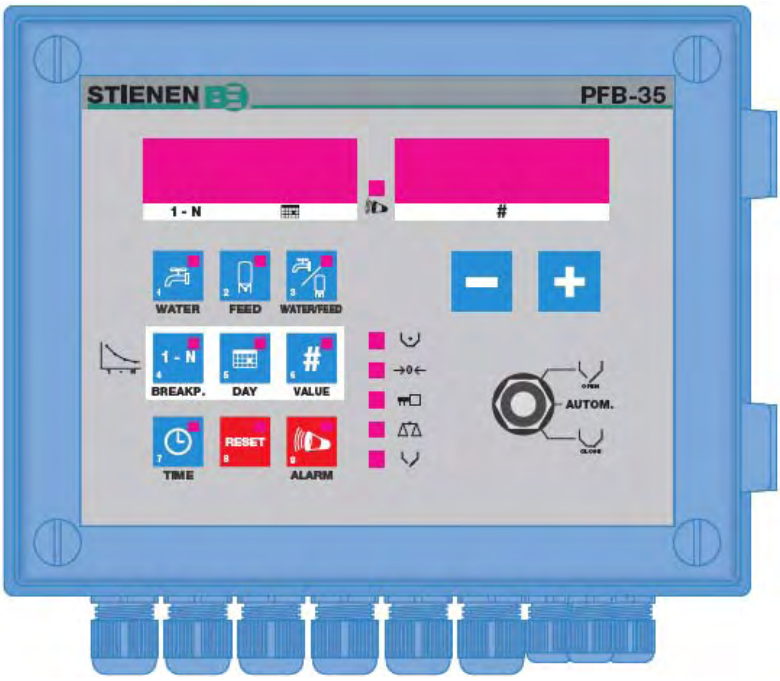
PFB-35

SERVICE MANUAL

OF THE

PFB-35 FEED WEIGHER



STIENEN

V 01.20.0

Shut down power before opening the feed weigher!

This feed weigher contains exposed live parts!

Only to be opened by authorized personnel!

WARNING

Although utmost care has been given to the quality of this equipment during the design and manufacturing stages, technical malfunctions can never be ruled out. The user should provide for an adequate alarm system and/or emergency provisions to prevent a technical failure of the equipment and peripheral facilities leading to danger to persons, animals or property.

NOTE DOWN THE FOLLOWING IN CASE OF AN EMERGENCY

- **Possible causes**
- **Circumstances in which the emergency occurred**
- **Date and software version number**
- **Installer settings**

Please contact our Customer Service Department, if you have any questions. Be sure to have all necessary data at hand. To ensure a speedy solution to the malfunction and to avoid any misunderstandings, it is advisable to note down the cause and the circumstances in which the malfunction occurred before contacting us (www.stienenbe.com).

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INTRODUCTION

Since feed costs make up a substantial share of the costs of production in poultry farming, an investment in an accurate feed registration system is an economically sound investment with a relatively short pay-back time. The PFB-35 feed weigher registers the amount of feed fed on the basis of weight.

The PFB-35 feed weigher can be used as a simple autonomous controller. The suitability of the PFB-35 feed weigher can be enlarged by connecting the feed weigher to a control computer.

The feed weigher has a memory chip in which all settings are stored to ensure that they are retained, even when the voltage is lost.

FEEDING CURVES

The amount of feed per day can be set using a maximum of 24 reference points for the entire production period.

FEEDING PERIODS

Feeding starts when the “START” contact closes (pulse or level input) and ends when the preset amount of feed has been dispensed (see page 26).

SILOS

The PFB-35 can autonomous drive one silo auger only.

MISCELLANEOUS FUNCTIONS

Water intake registration.

PFB-35 FEED WEIGHER AS FN485 DEVICE

If the PFB-35 feed weigher is fitted with a communication PCB (CB-COM), the PFB-35 feed weigher can be coupled to an external control computer via the FN485 communication loop.

In combination with a control computer and I/O modules the PFB-35 can:

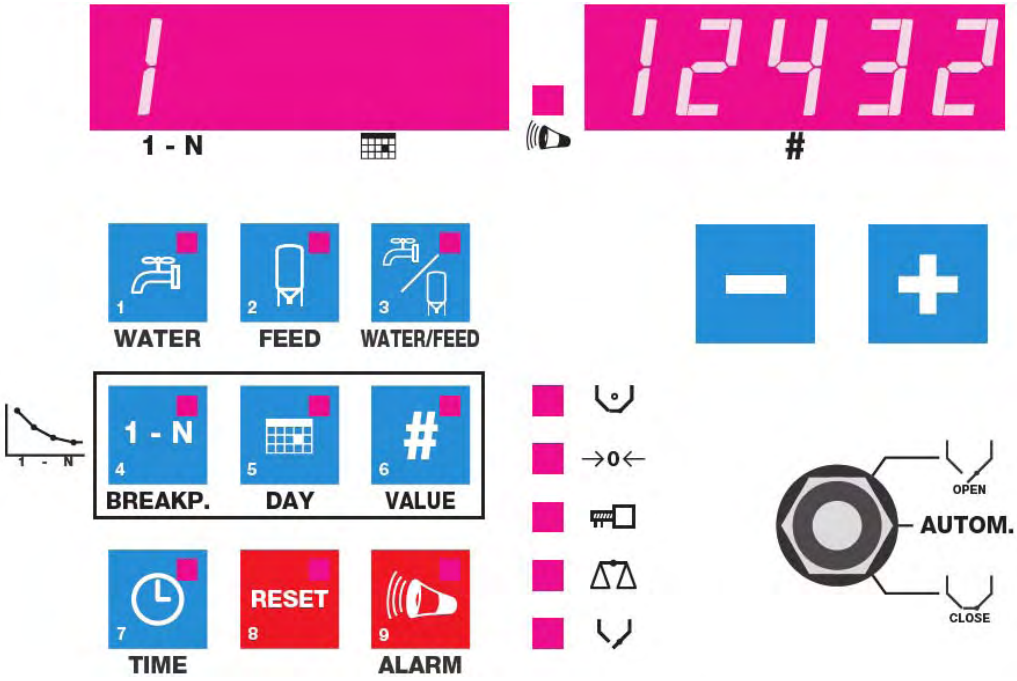
- ❑ Mix a maximum of 8 types of component from 16 silos.
- ❑ Spread the total quantity to be fed over the day, divided into 24 periods, using dosing timers.

I/O MODULES AND FN DEVICES

I/O module: You can use I/O modules to extend the number of outputs of the PFB-35 feed weigher, via the ST-BUS. The I/O modules are controlled and/or read out, via PFB-35 feed weigher, by the control computer. In this case the PFB-35 feed weigher is set to FN-device (parameter 1.06 is set to 1, see page 10).

FN device: An FN device is actually a control device which autonomously controls a sub-process. The parameters to control the sub-process are sent from the control computer to the FN-device via a special communication bus (FN bus). The control computer can monitor the process via this communication loop and correct it where necessary.

CONTROL PANEL



If no indicator light up in the keys and no dosage is started the total amount of feed dosed till now is shown on the right display (in kilogram). If a dosage is started the current silo number is shown on the left display and the current feed hopper contents is shown on the right display (in gram).

Checking measuring value / changing settings

If a key is pressed and the light lights up continuously, a measured value or a calculated setting is shown on the display. Press the same key again to change the corresponding setting (the light flashes).

A setting can be changed using the **+** and - (plus and minus) keys.

Attention! When the **CURVE** is **ACTIVE** or the feed weigher is connected to an external control computer, certain settings **CANNOT** be changed.

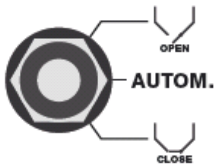
Key sequence

If a key sequence is shown you have to entered the given sequence (from left to right) before the measured and/or set value are displayed. The lights in the selected keys are continuously on. The light in the last selected key flashes if a setting is selected.

Alarm light

The (alarm) light lights up when there is an alarm. The light flashes when the 'main alarm' is off.

Manual operation



Set the 'manual operation switch' on the front to its upper position to open the discharge hatch. The silo auger is driven when the discharge hatch is fully open, provided that the feed sensor does not sense any feed. If the feed sensor senses feed, the feed supply is stopped temporarily until the feed sensor no longer senses feed. If you have several silos, you also have to operate the silo by hand (set DSR to position “1”).

Manual operation sequence:

1. Manually switch on the auger and/or the feed chain.
2. Set the switch of the DSR with the required type of feed (silo) to position “1”
3. Set the manual operation switch on the PFB-35 feed weigher to the “OPEN” position.

Afterwards set all 'Manual operation switches' to the ‘AUTOM.’ position (on the PFB-35, on the DSR modules and on the auger and/or feed chain).

The extra amount of feed you feed manually is NOT REGISTERED by the PFB-35.

WEIGHING CYCLE

1

If there is no feed in front of the feed sensor, the “**feed sensor status**” indicator will light up and the weighing cycle (create portion) **will start**.

If the indicator **does not light up or flash,** the weighing cycle **will not start**. Check that there is feed on or in front of the feed sensor, if so remove the feed. Check that the auger is running. Then briefly press the **[RESET]** button to restart the weighing cycle (see page 8).

2

The empty feed weighing hopper is tared first, the “**Taring weighing hopper**” indicator lights up during taring. If taring is successful, the indicator will turn off and the silo auger is driven.

3

The **silo auger is started** after weighing hopper taring. The silo auger stops when the calculated supply time has expired.

4

After the silo auger has stopped, the **weight** in the weighing hopper is **measured** exactly and the supply time (for the next weighing cycle) is calculated again.
The current weight in the weighing hopper is shown on the right-hand display.

Depending on the number of components (types of feed) to be mixed, steps 3 and 4 are repeated (the left-hand display shows the current silo number).

5

The **discharge hatch** is then opened. The weighing cycle starts again after the discharge hatch has been closed. This is repeated until the feeding cycle has been completed.

When one of the above indicators flashes a failure occur, see page 7.

WATER

Today's current counter reading is shown on the left-hand display (in litres)

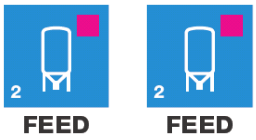
Yesterday's counter reading is shown on the left-hand display (in litres)

The total counter reading up to and including today is shown using both displays. 1212432 litres is shown as follows:

If you change the “0” to “1” all water counter readings (including the total volume) are deleted.

FEED

Current volume of feed dosed today (in kilograms)



Volume of feed dosed yesterday (in kilograms)

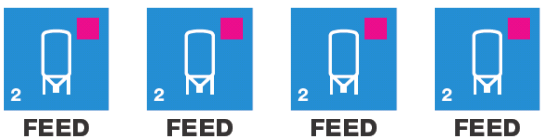
When the feed curve is active (day number is 1 or higher), the left-hand display shows the calculated amount to be dosed for the current feeding cycle.

If the feed curve is off (day number = 0), you can set the amount of feed to be dosed for the next feeding cycle on the right-hand display.

Note! If the feeding cycle has already started, the changed setting will not be processed until the next feeding cycle.

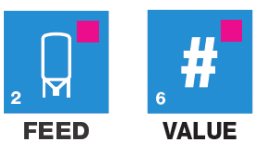
You cannot change this setting if the PFB-35 feed weigher is controlled by a control computer.

In case of **continuously feeding** (flow through weigher) you set a feed quantity which is not normally achieved in a day.



Amount of feed yet to be fed in the current feeding cycle (in kilograms)

You cannot change this setting if the PFB-35 feed weigher is controlled by a control computer.



Total amount of feed fed so far (shown using both displays). 1212432 kg is shown as follows:

If you change the “0” to “1” all feed counter readings (including the total amount) are deleted.

WATER/FEED RATIO

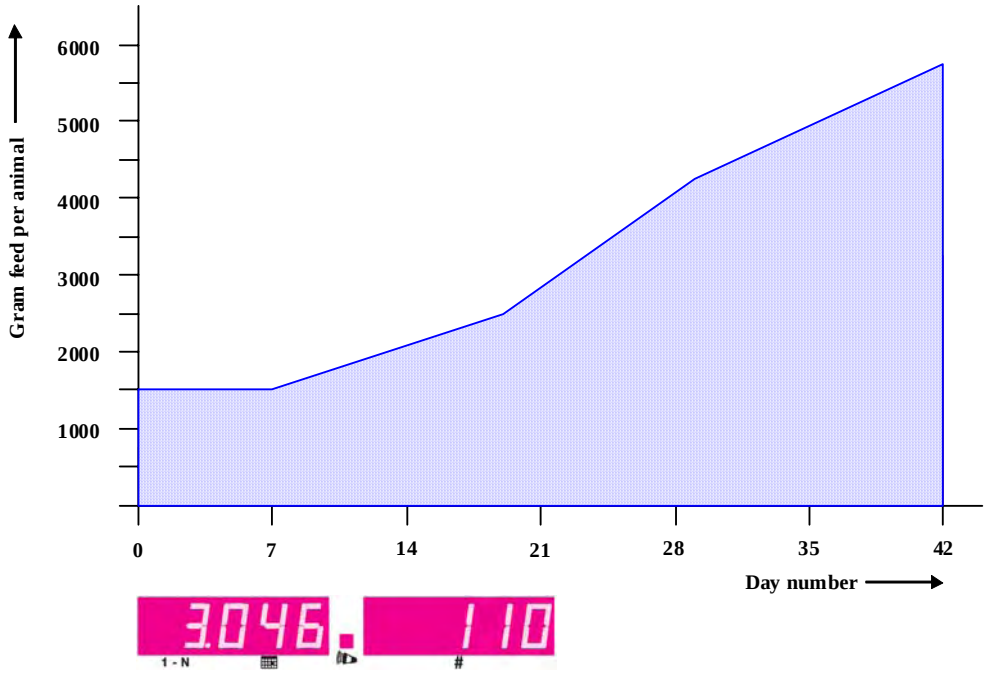
Today's current water/feed ratio is shown on the left-hand display.

Yesterday's water/feed ratio is shown on the left-hand display.

FEED CURVE

You can use the feed curve to pre-program the amount of feed to be dosed on the basis of the animals' age (provided that the PFB-35 feed weigher is **NOT** controlled by a control computer such as the PFM-9200 or PL-9200, in which case you cannot set a feed curve on the PFB-35 feed weigher). You must push a sequence of keys to set a curve. A curve consists of a maximum of 24 breakpoints.

Note! When the FEED CURVE is active, you can only change the feed dosage by changing the feed curve setting.



The breakpoint number which was set last is shown on the left-hand side of the left-hand display (the “BREAKP.” indicator is flashing). You can change the breakpoint number using the plus and minus keys.

The day number for the relevant breakpoint is shown in the right-hand display (the “BREAKP.” indicator lights up continuously and the “DAY” indicator flashes). You can change the day number using the plus and minus keys.

The left hand display shows the breakpoint number and the day number corresponding with the breakpoint. The total kilos of feed to be dosed per day from the day number set is shown on the right-hand display. You can change the dose using the plus and minus keys.

Switching the feed curve on/off

If you press the **[DAY]** key, the right-hand display will show the current day number of the curve. If this is **0**, the **feed curve is off**. If this is **1 or higher** the **feed curve is active**. You can use the plus and minus keys to set the day number between 0 and 999 (0 = curve off).

TIME

The time is used to increase the day number of the feed curve. Press the **[TIME]** key. The right-hand display shows the time; use the plus or minus key to change this value.

Start a new feed period

If you hold down the **[TIME]** key for 5 seconds or more, **the active feeding cycle is interrupted.** The feeding cycle is restarted afterwards.

ALARMS

Switching main alarm on/off

Press the **[ALARM]** key. The left-hand display now shows the current alarm code (0 = no alarm). In the right-hand display you can set that the alarm should be passed on to an external device through the “ERROR” relay (1) or that it should not be passed on (0). If you have set “do not pass on” (0) the "" indicator flashes. The alarm will only be passed on to the “ERROR” relay after an alarm delay time set by the installer has elapsed (standard 5 seconds).

If the main alarm is off, the feed computer CANNOT pass on ANY MORE ALARMS to the user and/or the connected equipment. This means that you should not switch off the main alarm too flippantly and that you have to understand the consequences involved. This also applies to the other alarms.

Switching an alarm group on/off

Press the **[ALARM]** key until the relevant alarm group is shown. Switch off the alarm of the group (the 'ALARM' indicator will turn off). Then switch on the alarm of the group again. **Note!** If you leave the alarm of the group off, the group in question can no longer generate alarms if a fault situation occurs.

E.g. if you set “AL 2” to “0” (off), all alarm codes which begin with 2, such as alarm code 201, will be switched off. The current alarm code is shown on the left-hand display.

Code	Description	
AL 1	Alarm group 1	n.a.
AL 2	Alarm group 2	Tare alarm
AL 3	Alarm group 3	n.a.
AL 4	Alarm group 4	Feed sensor or discharge hatch alarm
AL 5	Alarm group 5	Silo alarm

In the right display you can switch alarm group 1 on/off.

In the right display you can switch alarm group 2 on/off.

In the right display you can switch alarm group 3 on/off.

In the right display you can switch alarm group 4 on/off.

In the right display you can switch alarm group 5 on/off.

Latest alarm

The cause of the *alarm that occurred the last* is shown on the left-hand display. In the right-hand display the time until which the alarm is/was active is shown.

Reset alarm

Code 0 is shown on the left-hand display and the right-hand display shows the time the reset alarm occurred.

Alarm codes

General

Alarm code		Description
0	No alarm	-
1	Load cell alarm	Load cell defective, overloaded or load cell connected incorrectly.
2	Faulty weighing hopper calibration	The difference between taring an “empty” weighing hopper and a “full” weighing hopper (weighing hopper with reference weight) is too small (the difference between parameters 4.05 and 4.07 must be at least 2000). **Carry out the calibration procedure again.**
1x	Module x not installed	Module number x does not exist (x = module number)
2x	Module x reset alarm	The module x incessantly resets due to, for example, a fault, check the (x = module number)
3x	Configuration module x changed	Module configuration x (number of outputs) is changed. Upload the module number again (x = module number)
40	Feed sensor alarm	Feed sensor not connected (both the FEED and NO FEED indicators are off).
41	Feed sensor defect	Feed sensor not connected correctly (both the FEED and NO FEED indicators are on).
50	Voltage discharge hatch to low.	❑ Inspection cover has been opened ❑ Fuse F2 630mA, slow-acting, on bottom PCB broken
51	Discharge hatch blocked	❑ Feed has caked ❑ Something is stuck in the weighing hopper.

→0← AL 2 (Alarm code 2.xx)

201	Tare alarm 1:	Measured value after taring too high (zero + 5000 grams)	❑ Extra feed dropped after the discharge hatch closed. ❑ Feed has caked or something is stuck in the weighing hopper. ❑ Ambient vibrations affect the result of the measurement (the receptacle touches the chassis of the weighing hopper while unloading the weighing hopper or switching the auger on/off).
202	Tare alarm 2:	The measured value is not stable during taring.	
203	Tare alarm 3:	Measured value after taring too low (zero - 5000 grams)	

AL 4 (Alarm code 4.xx)

402	Feed sensor:	The feed sensor detects feed (feed indicator on) when the discharge hatch is opened.	❑ The feed sensor is covered by feed at the moment when the unloading valve opens. ❑ Discharge hatch opened with manual operation. ❑ Faulty feed sensor or feed sensor not connected.
404	Discharge hatch:	Discharge hatch did not open	Hatch not opened/closed after 10 seconds although it was given a drive signal to open/close it.
405	Discharge hatch	Discharge hatch did not close.	

AL 5 (Alarm code 5.xx)

500	Alarm silo	Not a valid silo number.	The component is not in the selected silo.
5xx	Alarm silo xx	Transport supply from silo xx has stagnated.	There is still no feed supply after 60 seconds. Stagnation in supply transport or silo xx is empty.

xx = silo number user (is set on the control computer).

Attention **NEVER FORGET TO SWITCH AN ALARM "ON" AGAIN** after switching it off, e.g. to solve a problem, since this may have harmful effects on people, animals, equipment or goods.

RESET

Restart weighing cycle

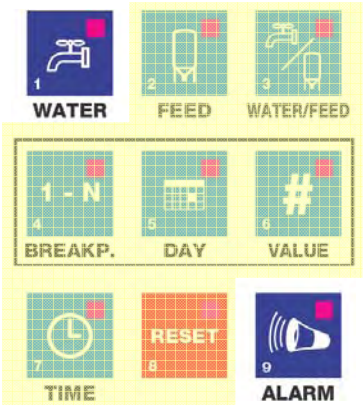
If there is an alarm and you briefly press the **[RESET]** key:
- ❑ The active alarm will be switched off (reset).
- ❑ The system will try to finish the active weighing cycle.

Abort weighing cycle

The active weighing cycle will be aborted (reset) if the **[RESET]** key is pressed for 5 seconds or longer. A new weighing cycle will be started then.

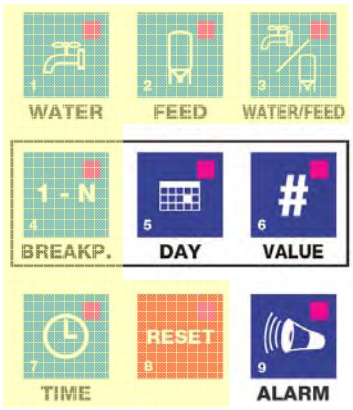
INSTALLER KEYS

Reset



If the feed weigher does not react anymore when a key is pressed, press keys **[WATER]** and **[ALARM]** simultaneously. Then the controller gets reset. The user and installation settings will NOT be lost.

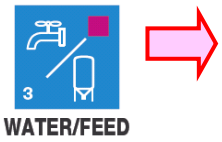
Access to installation settings



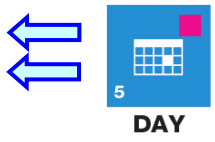
If the keys **[DAY]**, **[VALUE]** and **[ALARM]** are simultaneously pressed, then you get access to the installation settings. The code is shown on the left display, the matching adjustment or measuring value is shown on the right display.

By pressing the same key combination, you leave the installation settings again.

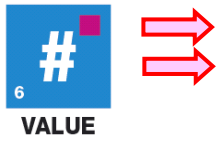
Previous setting



Next setting

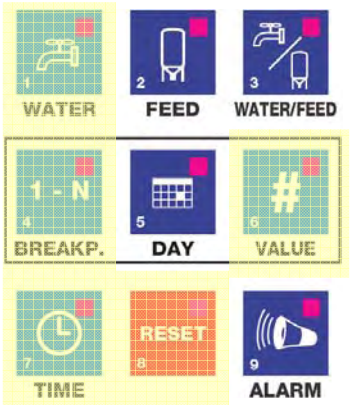


Previous group



Next group

Restoring factory settings



Get first access to the installer settings. Press then simultaneously on the keys **[FEED]**, **[WATER / FEED]**, **[DAY]** and **[ALARM]** to restore the default settings.

After restoring the default settings, the installation as well as the user settings must be entered once again.

By pressing the same key combination **[DAY]**, **[VALUE]** and **[ALARM]**, you leave the installation settings again.

During restoring the factory settings, ----. ---- is shown on the display for a short time.

Installer codes

Code	Description	Factory settings	Settings PFB-35
1.00	Device id (67 = PFB-35)	67	67
1.01	Software version	1.20	1.20
1.02	Communication address	1	
1.06	Configuration feed weigher: 0 = stand-alone, 1 = FN device [1]	0	
1.07	Number of modules [2]	1	
1.17	Delay time ERROR-relay [in seconds] [3].	5	
3.04	Pulse output feed (1 pulse per kg)	-	
3.07	Active module-output [4]	-	
4.00	Current contents feed hopper	-	
4.02	Calibrating feed hopper [5]	0	
4.03	Start calibration: no/empty/full [6]	0	
4.05	Calibration: Read-out value empty feed hopper	-	
4.07	Calibration: Read-out value reference weight	-	
4.08	Reference weight for calibrating feed hopper (in gram)	20000	
4.09	Capacity feed hopper in kilogram per weighing (portion)	20	
4.15	Start mode feeding process (pulse or level) [7]	1	
7.07	Water counter: multiply factor	1.00	

Explanation:

1. **Feed weigher configuration:** **0** = autonomous PFB-35 feed weigher (stand-alone system, max. 1 supply auger/silo), **1** = PFB-35 is a FN device. The feed weigher is controlled by a external control computer such as a PFM-9200 feed computer or a PL-9200 poultry computer. Maximum 16 supply augers/silos can be connected to the PFB-35 feed weigher when using DSR modules (max. 4 silos with one and the same type of feed, max. 8 different types of feed per feed weigher).
2. **Number of modules:** the number of modules is only important if the feed weigher is connected to an external control computer such as a PFM-9200 or PL-9200. The number of modules is the total number of DSR modules (DSR-3 or DSR-6) connected to the PFB-35 feed weigher (max. 6 modules). The module address must be a part of a continuous series of addresses. Start by 1.
3. **Delay time ERROR-relay:** this is the time, which must elapse between the appearances of an error (except a hardware error) and the actual switched “off” of the error relay. The standard time is set on 5 seconds. Fill in here ‘0’, and then the relay is immediately switched “off” in case of an error.
4. **Active module output:** module output which is currently “switched on”. Afterwards zero the parameter (output number), otherwise the selected output will continue to be active (output type B corresponds with the digit 1, i.e. 01B01 = 1101, 01B02 = 1102, 02B01 = 2101 etc.).
5. **Calibrating the weighing hopper:** **0** = do not calibrate, **1** = calibrate empty weighing hopper, **2** = calibrate “full” weighing hopper with (feed weigher with reference weight in hopper, standard 20 kg, see parameter 4.08)
6. **Start calibrating:** 0 = do not calibrate, **1** = start calibrating
7. **Start mode:** **0** = feeding cycle starts at pulse signal ( ), **1**= feeding cycle starts at high level signal ( ) and stops when the signal is lost.

The calculated supply speed in grams per second per silo (10.xx = silo 1, 11.xx = silo 2 etc.) is shown behind parameters 10.06 to 25.06.

The installer settings may only be modified by authorized persons!!!

TECHNICAL SPECIFICATION FEED WEIGHER

Specifications PFB-35

Dimension PFB-35	: 235 x 170 x 90 mm.
IP-Class	: IP-54
Supply voltage	: 24Vac 50/60Hz ±10%
Power consumption *	: 35VA (maximum)
Environment temperature	: -5°C up to +40°C
Inputs	: 1x Digital input for external start command
	1x Digital input for water counter
	1x Load cell input (max. voltage measurement inputs ΔV: 15mV)
Outputs	: 1x Open-collector pulse output (max. 35Vdc/20mA). 1 pulse per kilogram
	1x Alarm relay (make-and-break contact, max. 24Vdc/2A)
In-/outputs	: 1x Feed sensor (max. 24Vdc/2VA)
	1x Discharge hatch (valve motor-unit, 24Vdc max. 0,3A)
Communication	: 1x **FN devices** (bus for FN devices), for communication with the control computer. This is an RS-485 communication bus which is galvanically isolated (2-wire connection).
	1x **ST bus** (module bus), for communication with extension modules. This is an RS-485 communication bus which is not galvanically isolated (4-wire connection). **A maximum of 6 DSR modules may be connected to the ST bus.**

Specifications feed hopper

Dimension		555 x 590 x 545 mm (without PFB-35) 555 x 590 x 645 mm (with PFB-35)
Capacity		±88% of the auger capacity at 1000kg/hour ±63% of the auger capacity at 5000kg/hour ±46% of the auger capacity at 10000kg/hour
Weight	:	42 Kg.
Hopper contents	:	64 dm^3
Minimum free space under weighing hopper	:	150 mm.
Feed sensor	:	VC12RN924 (24Vdc)

Pulse input

The PFB-35 has 2 pulse inputs. A water counter can be connected to the “PULSE INPUT” input and a start command (pressure switches, timers etc.) to the “START” input.

Pulse output

In principle, the pulse output can directly switch the counter input of another device. However, some situations may require the counter input to be adjusted. The pulse output gives one pulse for every kilogram of feed that is dosed. The pulse output is an open collector output. The transistor used can switch maximum **20mA/35Vdc** to '0' ('Pull down'). The max. pulse frequency = 15Hz (min. pulse width = 50msec.).

Pulse frequency: Maximum pulse frequency = 15Hz. Minimum pulse width 50 milliseconds.

Alarm relay

For alarm purposes, the alarm outputs NO, P and NC can be connected to one of the external alarm inputs of an alarm system. When the feed weigher is active, the alarm contact, between "P" and "NO" in a no-alarm situation, is closed. The contact is broken if there is no mains voltage or if there is an alarm. The maximum voltage/current to be switched is **24Vdc/2A**. The alarm relay is activated with 'NO ALARM' (FAIL SAFE).

Discharge hatch

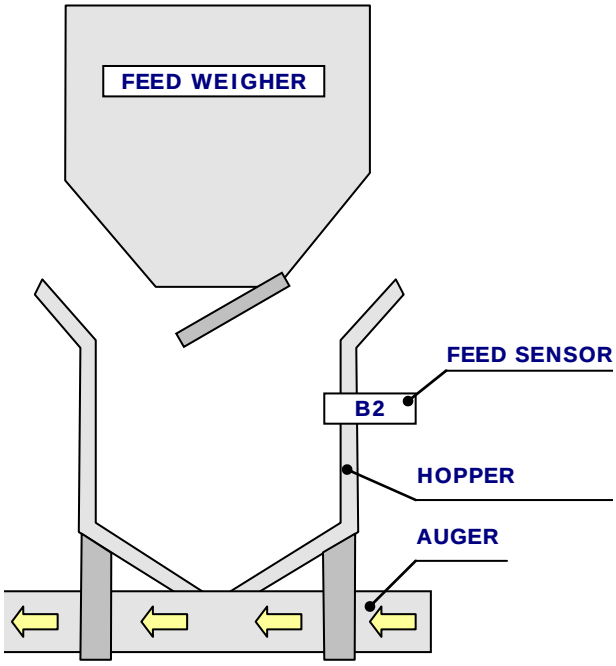
The discharge hatch is connected to the 'Valve' output located on the 'bottom PCB'. You can check the discharge hatch operation by setting the 'manual operation switch' on the front to its upper position. If you then set the 'manual operation switch' to its lower position, the discharge hatch will close again. Set the 'manual operation switch' to 'AUTOM.' (automatic) after you have checked the hatch operation.

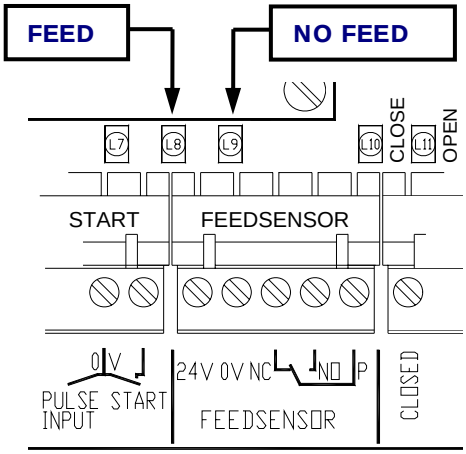
Manual operation

Note: The installer must ensure that the feed installation is provided with manual operation.

Feed sensor

The feed sensor is connected to the bottom PCB of the PFB-35. The feed sensor blocked the dosing process if the feed discharge flow stagnates. The block is lifted once the level is low enough again.





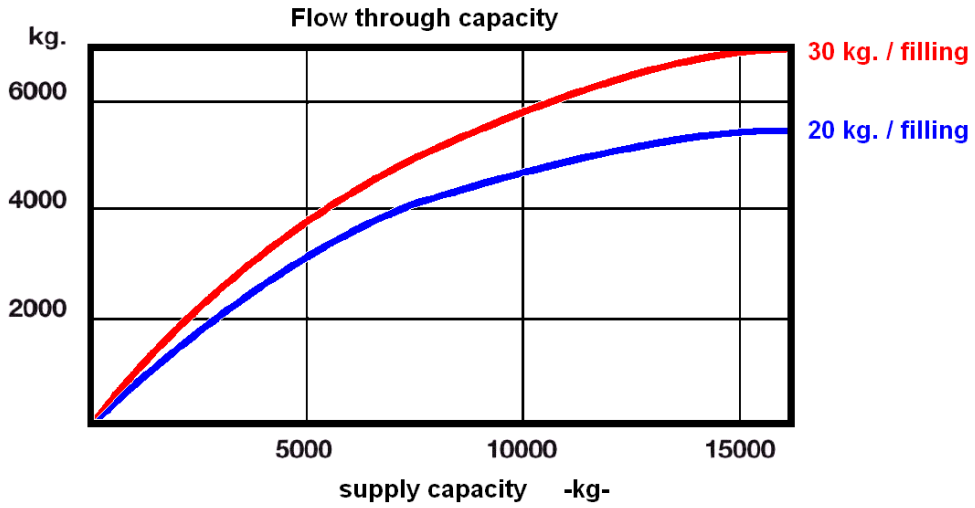
Feed for sensor	Red led sensor	Green led "FEED"	Greene led "NO FEED"
YES	OFF	ON	OFF
NO	ON	OFF	ON

Install the feed sensor into the receptacle under the weigher. The position of the feed sensor depends on the cubic capacity of the receptacle and the quantity dosed per cycle. The feed sensor must be placed such that there is sufficient room for at least 2 portions (dosing volumes) in the receiving hopper.

The discharge hatch only opens if the sensor is not active (the red indicator on the sensor is lit continuously).

Note:	All three the P, NO and NC contacts of the sensor must be connected.
Tip:	Position the feed sensor longitudinally in respect of the auger, opposite the 'discharge end', in view of feed possibly amassing at the discharge end.

Flow through capacity



The above graph shows the interrelation between the supply capacity (for 1 silo auger in kilograms per hour), dosing weight (portion size, kilograms per fill) and discharge capacity (discharge speed).

Silos

The number of silos primarily depends on the system (number of silos). If the feed weigher is used as an autonomous device (stand-alone), you have no more than 1 silo auger at your disposal. If the feed weigher is coupled to a control computer and provided with DSR modules, the system can comprise a maximum of 16 silo augers.

INSTALLATION PFB-35 FEED WEIGHER

Installation sequence

The process of setting up the installation and putting it into operation must be carried out with great care. The following installation sequence has been established for this purpose:

1. Select the equipment to be used.
2. Connect installation in accordance with the diagrams (see appendices).
3. Release load cell transport lock.
4. Change hardware settings according to installation requirements.
5. Check operation of load cell.
6. Check operation of discharge hatch.
7. Check operation of feed sensor.
8. Calibrate feed hopper (if required).
9. Complete hardware setting's form.
10. Check and test installation.

Assembly instructions

Do **not** position the weighing hopper with the inspection hatch **against or too close to** a **wall**. Reason: The discharge hatch motor and load cell must be accessible for inspection and maintenance.

Keep ambient conditions in mind.

- ❑ **Never** place a computer **in a humid environment**.
- ❑ **Ambient temperature must be between -5°C and +40°C**.
- ❑ Prevent dust penetration: seal all cable inputs.

Tips for good feed registration

- ❑ Adjust the supply and discharge augers to the required feed capacity.
- ❑ Keep the weigher and the receptacle free from dust and moisture.
- ❑ The augers must not affect the weighing result.

Note

The relay output “AUGER” of the bottom PCB may be charged with **a maximum of 2A**. All feed augers must be switched by means of a magnetic switch.

Place an operating switch in the mains supply for each PFB-35 so that the power can be switched off for servicing, etc. Note that the control voltage for the feed augers, magnetic switches, etc. will be switched off along with the computer voltage.

Combining signal cables with control cables is **not permitted**. **Never place signal cables and 230/400 Volt cables next to each other; ensure that there is adequate space between them**. Lay the signal cables in a separate cable duct. If the ducts are made of plastic, **the distance between the two ducts must be at least 30 cm** (for technical reasons, this does not hold for the first and/or last meter of cable). Metal ducts, with a built-in separated signal cable duct, may also be used. In this case, the metal ducts should be earthen.

Advise the user as to how the feed weigher is to be cleaned. Cleaning with a damp cloth, for example, on condition that the main voltage supply has been switched off, is permitted. **Cleaning with a high-pressure sprayer is NEVER allowed under any circumstances**.

Installation requirements

1. Implement the installation according to all-applicable standards and directives.

2. Do not place a feed weigher in a dusty room and, most of all, not in a room with animals. Make sure that water condensation is made impossible in or on the feed weigher. Do not install the feed weigher with the topside against or close to a heating pipe, this in connection with heat dissipation.

3. Level the feed weigher and secure all four legs to the surface.

4. Connect the transformers (for flaps and relay) behind a work switch so that they simultaneously have no tension when the feed weigher is turned off.

5. Connect all sensors to the feed weigher with a separate cable.

6. Mount auxiliary-relay, transformers, 'Power-modules' and other components in a separate cabinet.

7. Never place signal cables (sensors, communication, 0-10Volt signals etc.) and 230Vac-cables (electric lines, mains supply, etc.) next to each other but place them far apart from each other (several tenths of centimeters).

8. Avoid unnecessary loops in the cabling.

9. Earth metal cable ducts.

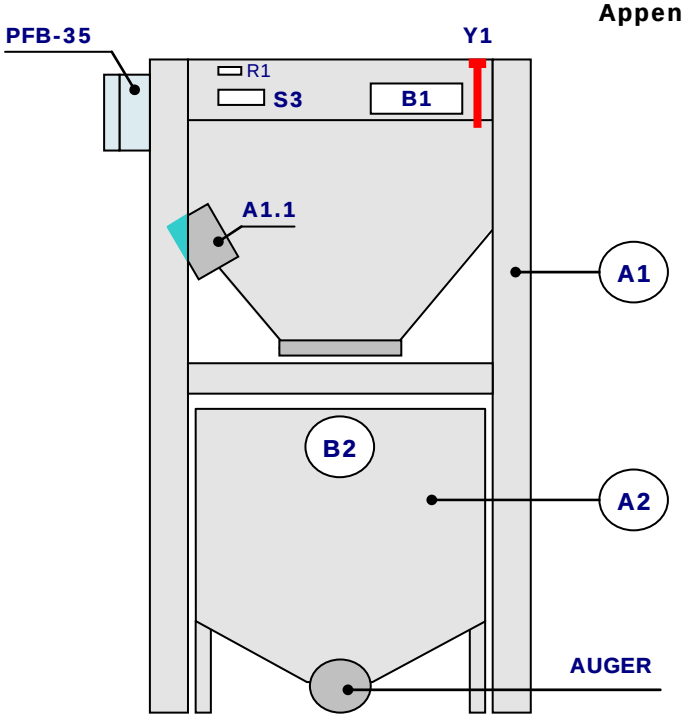
10. After the installation, screw on tightly and seal all cable glands of the feed weighers, peripheral equipment and sensors, etc. to avoid dirt and humidity.

Wiring cables

24Vac Supply voltage *	3 x 0,8 mm²	max. length 50 meter
	3 x 1,5 mm²	max. length 100 meter
	3 x 2,5 mm²	max. length 150 meter
	3 x 4,0 mm²	max. length 250 meter
FN485 communication	2 x 0.35 mm² twisted pair **not** shielded (UTP, max. 1250 meter)	
Water counter	2 x 0.5 mm²	
Start signal	2 x 0.5 mm²	
ST-bus	4 x 0.5 mm² (max. 1250 meter)	

* If the distance between PFB-35 feed weigher and control computer is too far you can use an external voltage supply of 24Vac/35VA to supply the PFB-35 feed weigher.

FEED HOPPER

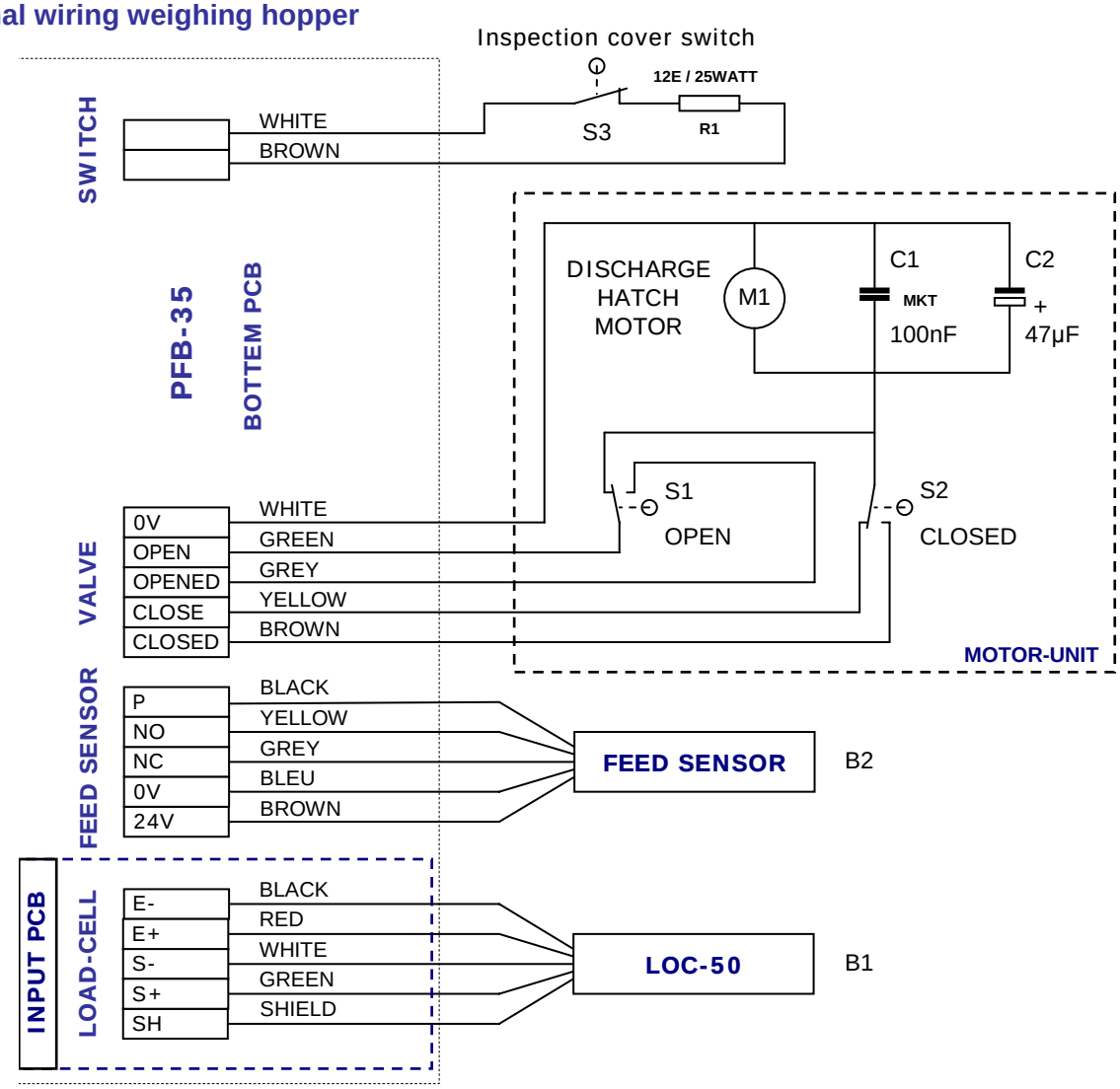


After installing the weighing hopper, including the chassis, in its final location and securing it to the surface, screw down the transport lock (unscrewed all the way down).

The load cell and the discharge hatch motor are located in the weighing hopper. To access the load cell and/or the discharge hatch motor, you first have to remove the inspection cover. The discharge hatch motor is then switched off for safety considerations.

A1 : Weighing hopper + chassis
A1.1 : Motor unit
A2 : Hopper
B1 : Load cell
B2 : Feed sensor
S3 : Inspection cover switch
Y1 : Transport protection

Internal wiring weighing hopper

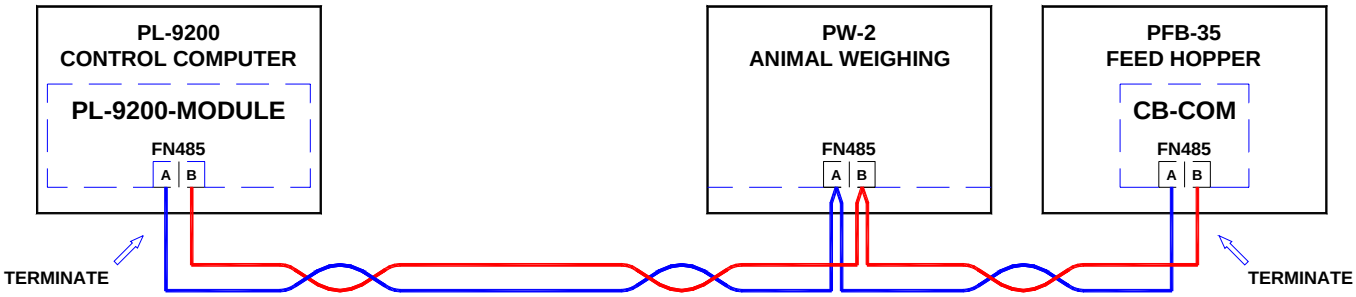


Calibrating feed hopper

1. Remove inspection cover (right side feed weigher).
2. Check that the transport lock is loose (unscrewed all the way down), see page 16.
3. Restore the inspection cover. Check that the inspection cover is closed (the green “SWITCH” led lights up).
4. Empty the weighing hopper by opening and closing the discharge hatch once (set the front switch to the “OPEN” position for a couple of seconds and then set it to “CLOSE”). Check that the weighing hopper is completely empty.
5. Go to the installer's mode (see page 9).
6. Select line 4.02 and change the “0” to “1” (1 = calibrate empty weighing hopper).
7. Select line 4.03 and change the “0” to “1”. Calibration is started; after calibrating, parameters 4.02 and 4.03 automatically change to “0”.
8. Place a reference weight of, for example, 20 kg in the weighing hopper.
9. Select line 4.08 and check that the reference weight in the weighing hopper (20 kg) equals the reference weight setting on the display (20000 = 20 kg).
10. Select line 4.02 and change the “0” to “2” (2 = calibrate weighing hopper “full” with reference weight in hopper).
11. Select line 4.03 and change the “0” to “1”. Calibration is started; after calibrating, parameters 4.02 and 4.03 automatically change to “0”.
12. Select line 4.00 (current weighing hopper content).
13. Remove the reference weights from the weighing hopper one by one while checking that the value on the display equals the weight remaining in the weighing hopper.
14. Check that all weights have been removed.
15. Enter parameters 4.05 and 4.07 on the installer codes list (see page 10).
16. Set the front switch to “AUTOM.” (automatic).
17. Exit the installer's mode (see page 9)

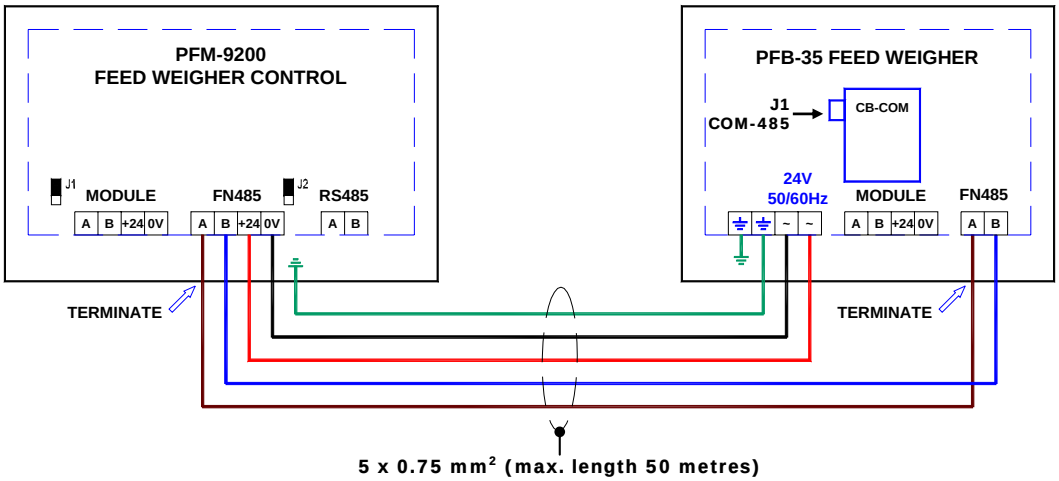
COMMUNICATION

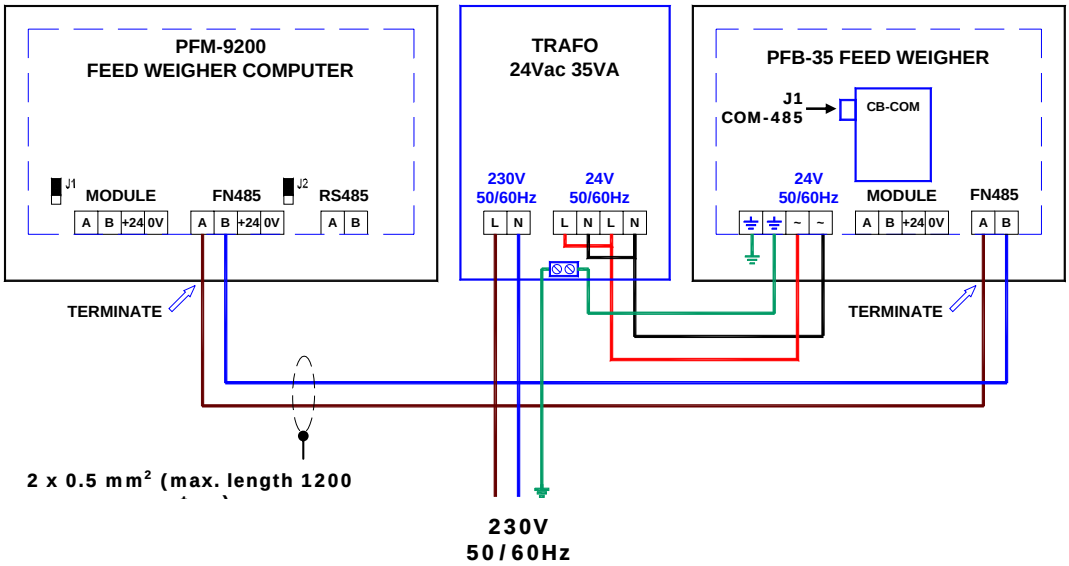
Communication between PL-9200 control computer and FN devices (FN bus)



All controllers in the FN485 loop must have a communication plug-on PCB, except the PL-9200 control computer and the PW-2 animal weighing modules. The communication interface (FN485-bus) on the PW-2 animal weighing module has been integrated with the bottom PCB. The PL-9200 control computer must be fitted with a PL-9200-MODULE PCB (the FN485 connection is located on this PCB). In addition, the FN BUS of the PL-9200-MODULE PCB must be connected to the FN BUS of the PL-9200-CPU PCB (PL3000_DEK03 or higher) using a 10-pole flat cable.

Communication between PFM-9200 control computer and PFB-35 feed weigher.

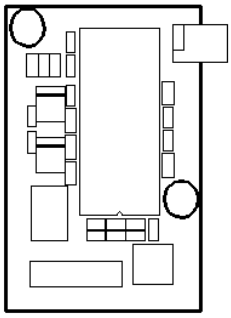
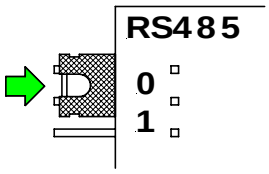




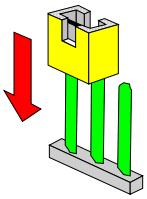
The PFB-35 feed weigher must have a communication plug-on PCB.

Installing a plug on PCB

The plug-on PCB is plugged upside down (with the components facing downwards) in the connector beside the input PCB (load cell connector). **The plug on PCB must be ordered separately. One plug on PCB is needed per feed weigher.**

CB-COM	Terminating loop
	
The CB-COM is a RS-485 communication interface **without-safe resistors**.	The jumper must be in position “0” on all feed weighers, except on the two feed weighers that are physically located at the end of the communication loop, on these two controllers it must set to “1”.

Terminating FN bus on control computer

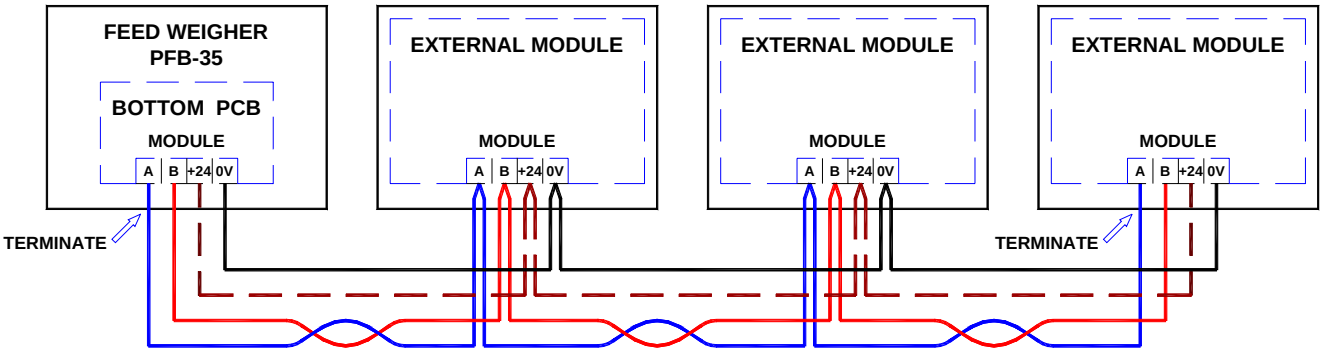


Jumper

Put the jumper in position ‘1’ if the PL-9200 or PFM-9200 control computer is at the beginning or at the end of the FN bus or put the jumper in position ‘0’ if this is not the case. On the FN devices which physically terminate the loop, you also have to put the jumper in position ‘1’; on all other FN devices you put the jumper in position ‘0’.

The TXD and RXD led’s on the PFM-9200 or PL-9200 control computer PFB-35 are flashing when the control computer is communicating with the PFB-35 feed weigher.

Communication between external modules

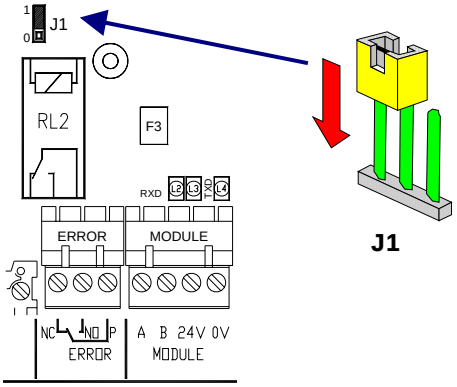


Communication between the feed weigher and the external I/O modules takes place through SEPARATE COMMUNICATION LOOP (ST bus). This communication loop is only suitable for communication between the feed and external modules.

The 24VDC connection of the "MODULE" output can be loaded to max. 100mA. The green led L4 will be turn off in case of a short circuit or an overload of the 24Vdc. A maximum of 6 modules may be connected to the feed weigher.

The TXD (L2) and RXD (L3) led's are flashing when the feed weigher is communicating with one of the connected external modules.

Terminating ST-bus

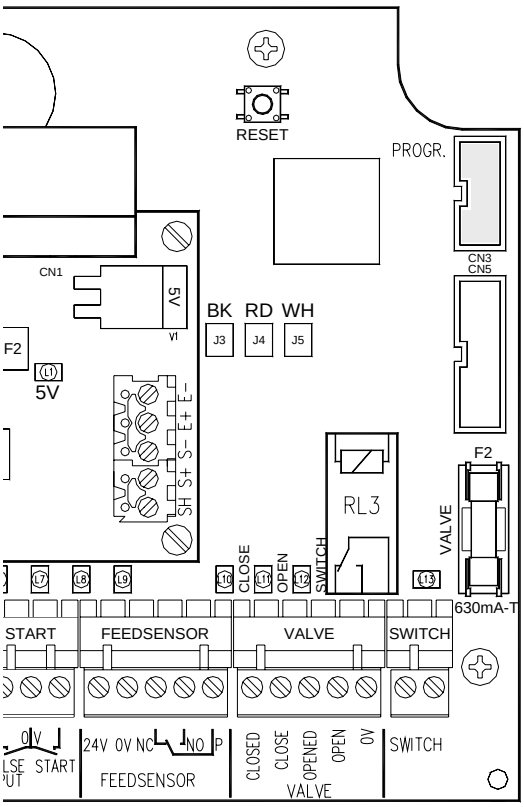


Put the jumper J1 (located in the left-hand upper corner over relay RL2) in position '1' if the feed weigher is at the beginning or at the end of the ST bus and put the jumper in position '0' if this is not the case.

You also have to put jumper J1 in position '1' on the external module which physically terminates the loop; put the jumper in position '0' on all other external modules.

SOFTWARE UPDATE

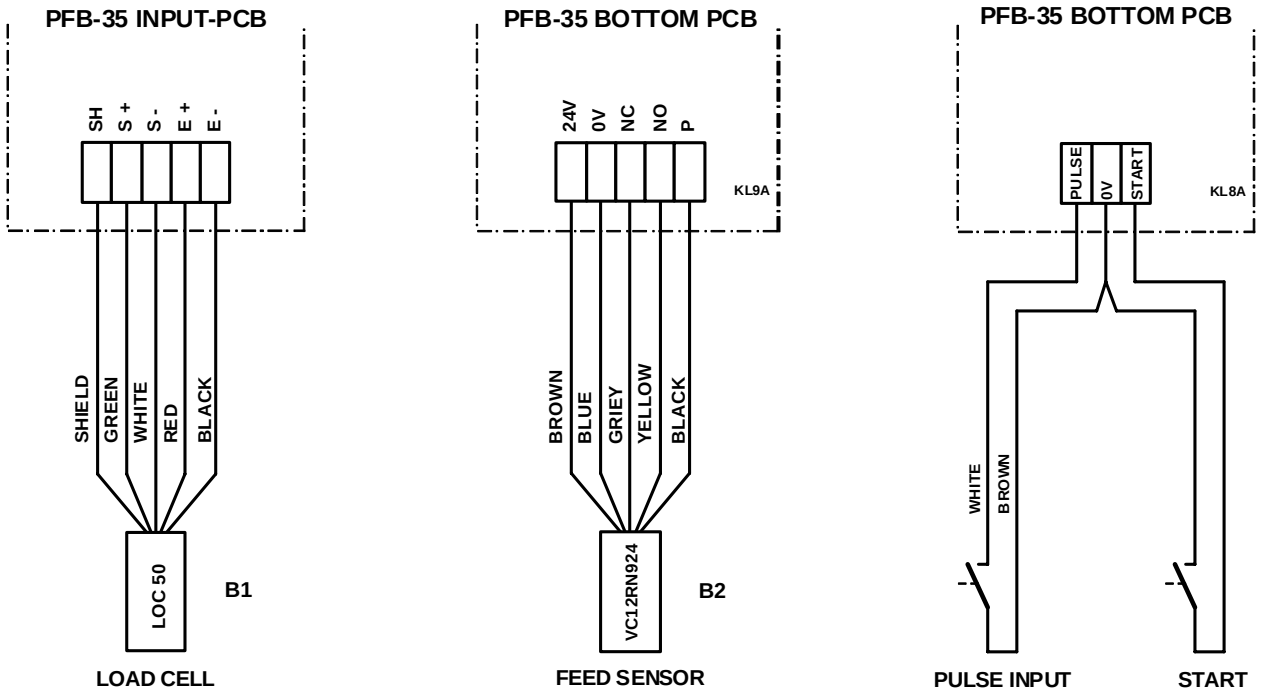
To update the software you can order a programming key (provided on loan) with the required software version. In addition to the order number (91.50.00) state the device type (PFB-35) and the software version required.



Program key (key fob)

1. Write down all the user and installer settings.
2. Place the programming key in the programming connector “PROGR” (CN3), see the drawing above.
3. The green led of the programming key lights up briefly.
4. Press the blue key of the programming key.
5. The green led will flash for approx. 20 seconds (if the indicator lights up red or does not stop flashing, something has terribly gone wrong during programming; contact the software dealer then).
6. When the green led stops flashing, the new software has been uploaded to the controller.
7. Remove the programming key.
8. Restore the default factory settings, see page 9.
9. Reprogram the settings you have written down before.
10. Check the function of the feed system.

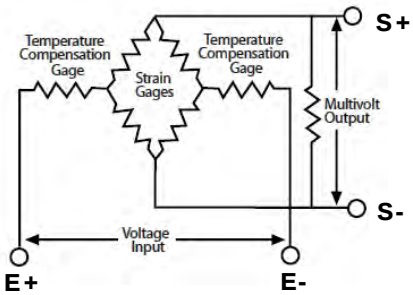
SENSORS AND DIGITAL INPUTS



Load cell

LOC-50

The LOC-50 is a single ended beam load cell. The maximum overload is 150%



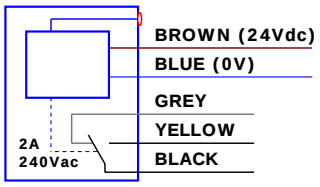
S+	=	+ Signal	Green
S-	=	- Signal	White
E+	=	+ Excitation	Red
E-	=	- Excitation	Black

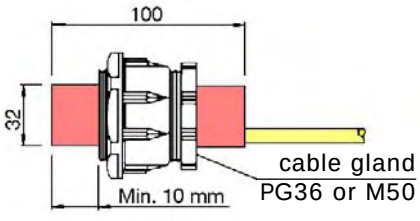
Connect shield to PFB-35 bottom PCB (shield).

Feed sensor

VC 12RN924

The VC 12RN924 is a capacitive level switch with a relay output, maximum load 230Vac/2A





Mounting instruction for the VC 12RN924 through the wall of the feed relief barge

Water counter + pulsar

The W-25 is a water counter with a pulsar. The pulsar is powered by a non-replaceable lithium cell with a life of about 10 years (for life time see label on cable). Pulse weight: 1 liter per pulse

Output: NPN, open collector transistor, maximum load 60V/ 200mA

(brown = GND, white = +/pulse).

VC12RN924: The red led lights up when the sensor detects no feed, the relay is energized (the yellow cable is connected to the black cable).

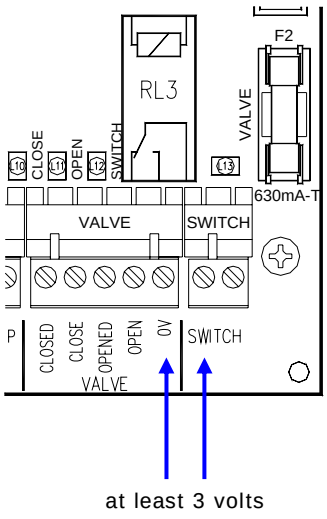
FAILURE ANALYSIS

Malfunction silo auger:

- ❑ No 24Vac power supply PFB-35, the display does not light up.
- ❑ The switch on the front of the PFB-35 is NOT in the “AUTOM.” (automatic) position.
- ❑ The module is NOT detected (error message on control computer e.g.: “Invalid silo output”), press the reset button on the bottom PCB of the PFB-35.
- ❑ Thermal cut-out of silo auger triggered.
- ❑ The silo auger work switch is in the wrong position.
- ❑ Feed sensor detects feed (the green FEED led lights up).
- ❑ The switch on the front of the DSR module is NOT in the “AUTOM.” position (if the DSR module has been installed)
- ❑ No DSR module mains voltage (if a DSR module has been installed).
- ❑ System fuse(s) defective (no 230Vac power supply for silo auger).
- ❑ The silo is connected to the wrong output terminal or to an output terminal which is not used.
- ❑ Relay output “B1 AUGER” does not work.
- ❑ Check the silo connections on the DSR module (if installed).
- ❑ Check the wiring between PFB-35 and the DSR modules (if installed).
- ❑ You are in installer mode and you have manually changed parameter 3.07, e.g. to test the outputs. However, the output selected remains active until you leave the installer's mode.

Malfunction discharge hatch motor:

- ❑ Manual operation is not on automatic
- ❑ Fuse (F2) defective.
- ❑ The inspection cover is open (safety switch on)
- ❑ The discharge hatch motor output is overloaded (the discharge hatch jams). Measure the voltage between the 0V and the left-hand terminal of the switch input. This must be at least 3 volts.



REPLACEABLE PARTS

1 x F1: fuse 1.6A, slow-acting 250V 5x20mm power supply feed weigher.
1 x F2: fuse 630mA, slow-acting 5x20mm for discharge hatch.
1 x Bottom PCB PFB-35
1 x Cover PCB PFB-35
1 x Input PCB PFB-35 (input load cell LOC-50kg)
1 x Communication plug-on PCB (CB-COM for FN485)
1 x Feed sensor (type VC12RN924)
1 x Load cell (type LOC-50kg) [1]
1 x Discharge hatch motor (24Vdc type 21A-BM-90-Z654) with attached reduction.
1 x Discharge hatch unit, including 2 micro-switches and crankshaft.
1 x Set of micro-switches (Omron type V-165-1C5)
1 x End switch (Omron type D4D-1120N)

[1] **You must recalibrate** the weighing hopper after replacing the parts.

Replacing bottom PCB

Pay attention to the following when **replacing the bottom PCB**:

Switch off and disconnect the 24Vac supply voltage.
Disconnect the front switch from the bottom PCB.
Disconnect the connectors (module, communication, FN485, pulse out, pulse in, start etc.).
Disconnect the flat cable between the bottom and the key-board PCB.
Remove the input PCB.
Remove the communication plug-on PCB.
Remove the bottom left and right screws of the bottom PCB.
Replace the bottom PCB.
Screw down the bottom PCB.
Install the communication plug-on PCB.
Install the input PCB.
Connect the flat cable between the bottom and key-board PCB.
Connect the connectors
Connect the front switch again.
Connect 24Vac.
Double-check that everything has been connected correctly again.
Switch on the 24Vac voltage.

After replacing the bottom PCB you **must recalibrate** the weighing hopper.

Replacing input PCB PFB-35

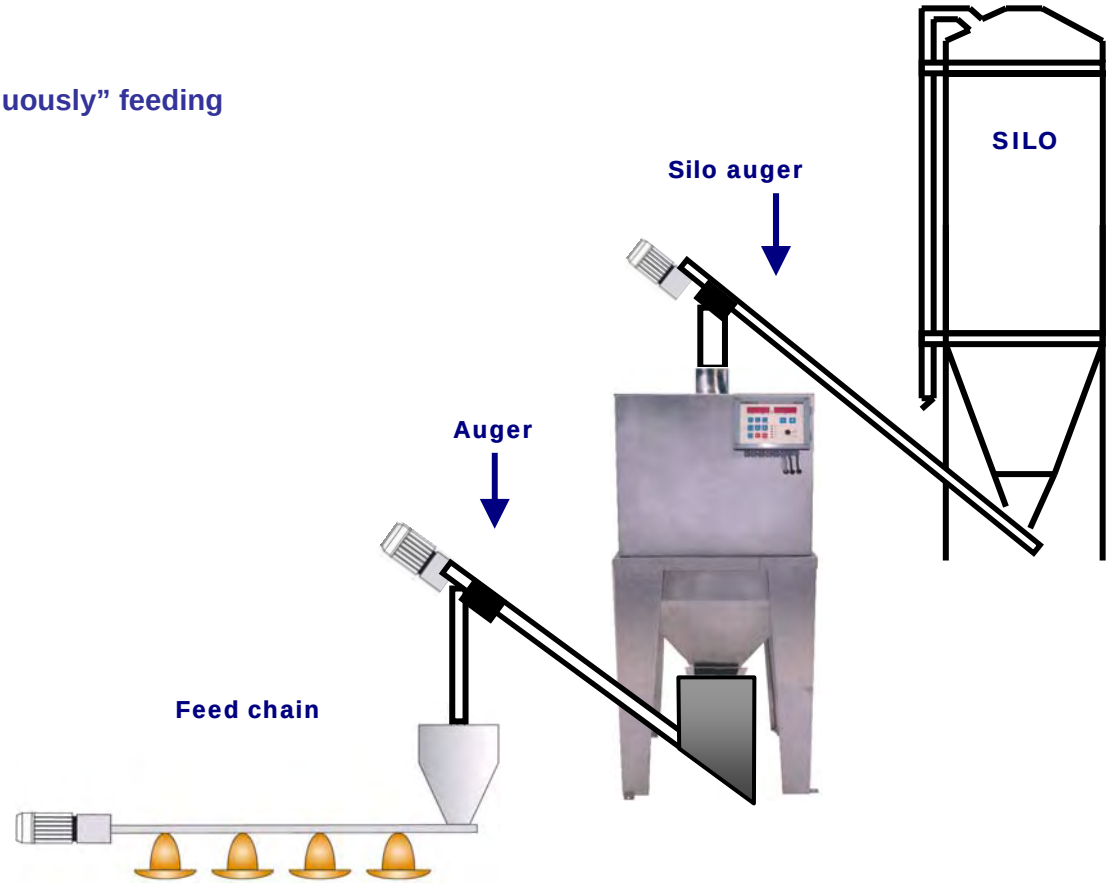
Pay attention to the following when **replacing the input PCB**:

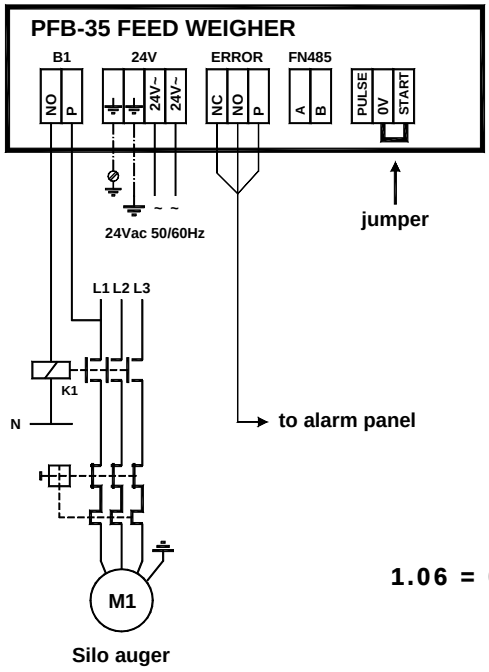
Switch off the 24Vac mains voltage.
Remove the bottom left and right screws from the input PCB.
Disconnect the flat cable between the bottom and the input PCB.
Disconnect the load cell (LOC-50kg) wiring.
Replace the input PCB.
Connect the flat cable between the bottom and input PCB.
Screw down the input PCB.
Reconnect the load cell (LOC-50kg).
Switch on the 24Vac voltage.

After replacing the input PCB you **must recalibrate** the weighing hopper.

WIRING DIAGRAMS

“Continuously” feeding

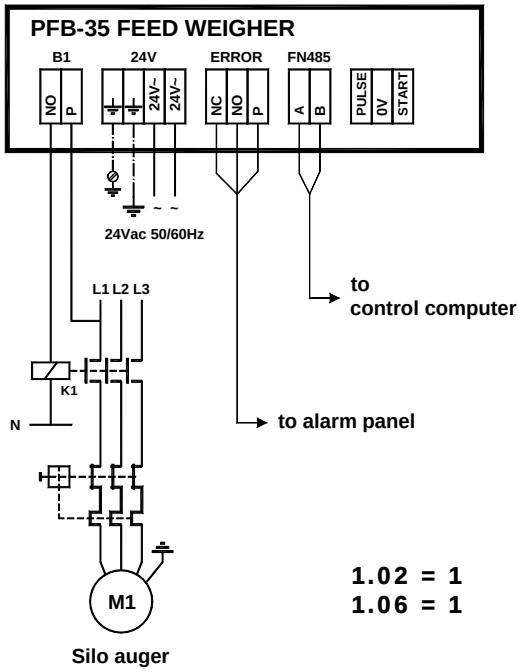




1.06 = 0

A bridging wire is installed between the “START” input and 0V.

The next feeding cycle **starts automatically at midnight** (00:00 a.m.).



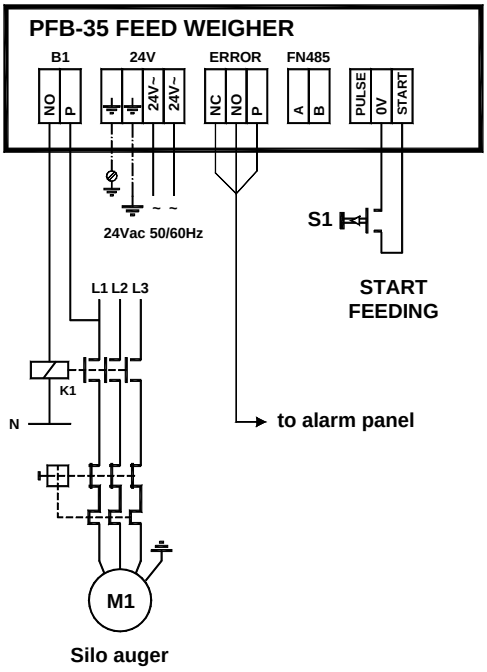
1.02 = 1
1.06 = 1

In this situation **a new feeding cycle starts automatically when** the current feeding cycle has ended (the preset number of kilos has been reached)**.**

For continuous feeding using the control computer, the feed weigher must be provided with a CB-COM communication PCB.

In cases of **continously feeding** (the feed weigher is used as a flow through weigher) you must set a feed quantity for the feeding cycle which is not normally achieved in a day; the feed weigher will feed continuously then.

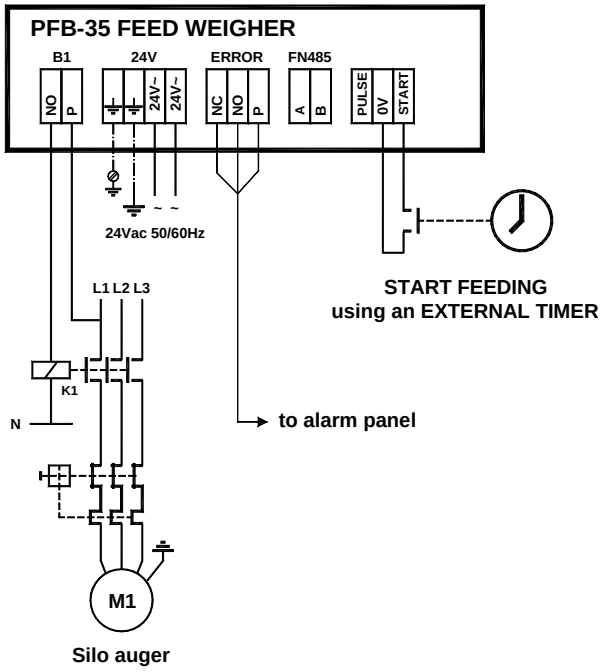
Start feeding using a “START” push-button



The feeding cycle starts when the “START” button is pressed. **The feeding cycle stops** automatically when the preset number of kilos is reached.

Set parameter 4.15 to “0” (pulse)

Start feeding using an external timer

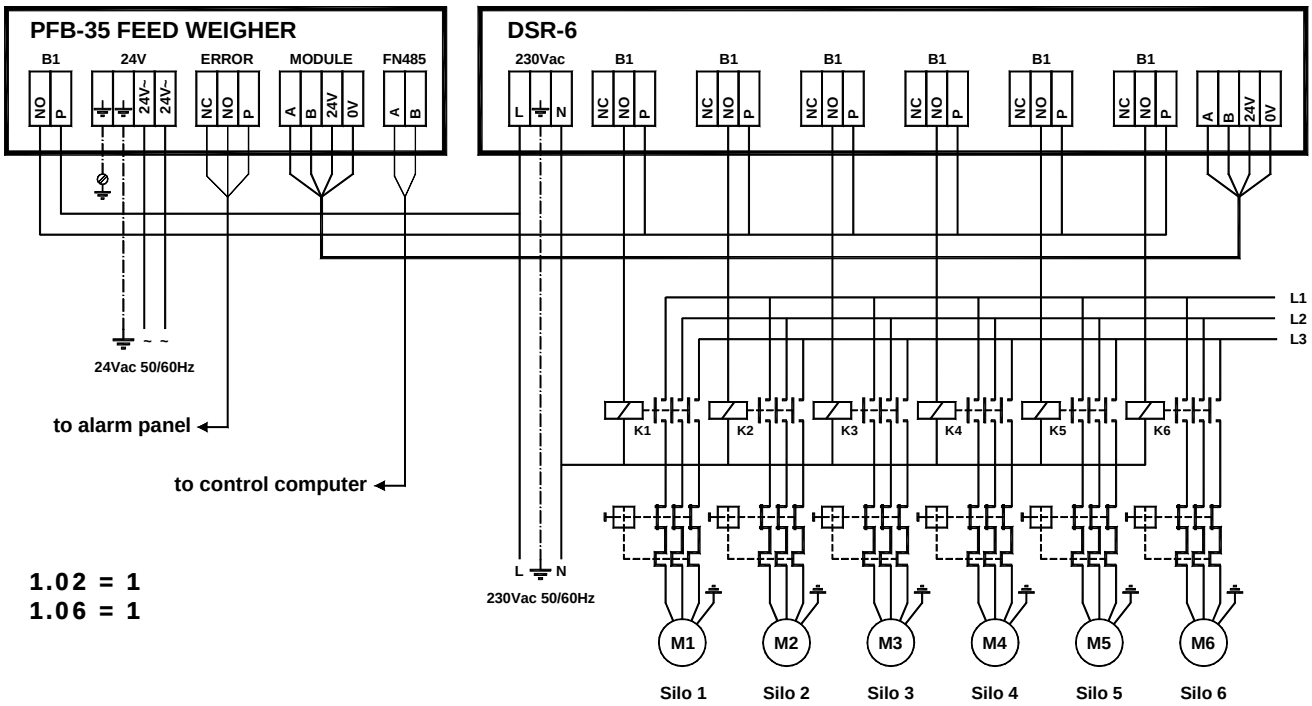


The feeding cycle starts when the “START” contact is closed. **The feeding cycle stops** automatically when the preset number of kilos is reached or the contact is broken.

Set parameter 4.15 to “1” (level, default factory setting)

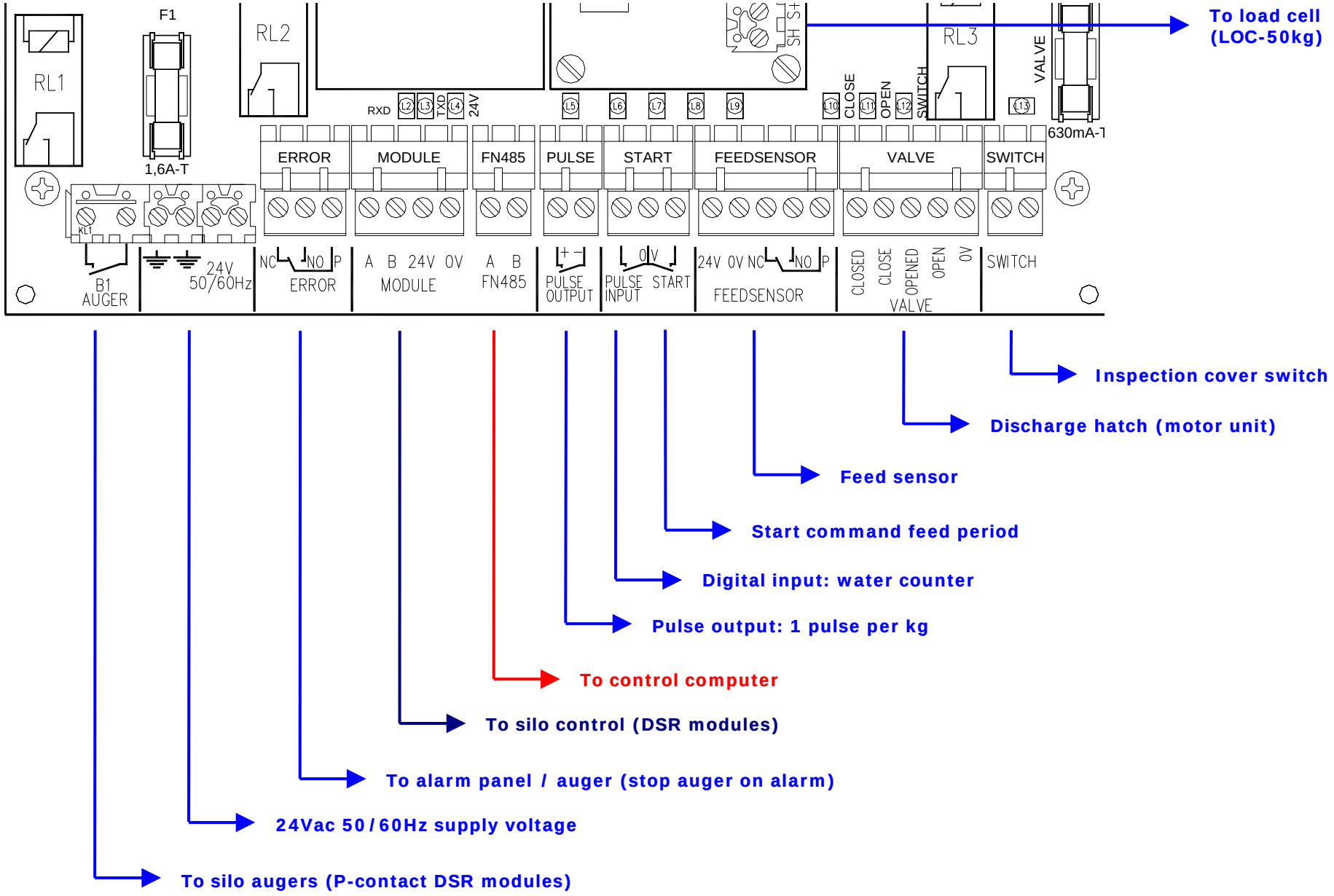
Pushing “START” again will restart the dosage process.

Feeding from several silos using a control computer



- ❑ The START input is NOT used.
- ❑ You must provide the feed weigher with a CB-COM communication PCB.
- ❑ A maximum of 16 silos can be controlled using DSR modules (you can connect max. 3x DSR-6 modules or 6x DSR-3 modules).
- ❑ The control computer uses the feed mixture and the silo assignment to determine the silos from which feed has to be fed.

CONNECTORS BOTTOM PCB



Installer codes

Code	Description	Settings PFB-35
1.00	Device id (67 = PFB-35)	67
1.01	Software version	1.20
1.02	Communication address	
1.06	Configuration feed weigher: 0 = stand-alone, 1 = FN device [1]	
1.07	Number of modules [2]	
1.17	Delay time ERROR-relay [in seconds].	
3.04	Pulse output feed (1 pulse per kg)	
3.07	Active module-output [3]	
4.00	Current contents feed hopper	
4.02	Calibrating feed hopper [4]	
4.03	Start calibration: no/empty/full [5]	
4.05	Calibration: Read-out value empty feed hopper	
4.07	Calibration: Read-out value reference weight	
4.08	Reference weight for calibrating feed hopper (in gram)	
4.09	Capacity feed hopper in kilogram per weighing (portion)	
4.15	Start mode feeding process (pulse or level) [6]	
7.07	Water counter: multiply factor	